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Prevalence of Goat Warble Fly, *Przhevalskiana* spp. (Dipetra: Oestridae), in West Azarbaijan, Iran

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Abstract

Goat warble fly infestation is a subcutaneous myiasis, presents in many European and Asian countries. Between September 2004 and June 2005, Goat warble infestation was investigated in the Urmia abattoir. The number of infested animals, their sex and age, the number of maggots present on each animal, location and larval stage of warble flies were recorded. Warbles were counted, measured and isolated by squeezing the subcutaneous nodules. 867 native goats (185 males and 682 females) were examined. 113 (13%) goats were parasitized, in which 91(80.5%) were females and 22(19.5%) were males. According to the results, out of 277 and 590, ≤2 and >2 years old animals, 32 (28%) and 81 (72%) were infested to *Przhevalskiana* spp respectively. There was no significant difference between infestation of males and females and among two different age groups ($p<0.05$). During the study 699 warbles flies larvae found in the subcutaneous tissue of slaughtered animals. The minimum, maximum, and mean number larvae per animal were 1, 18 and 6.18, respectively. The counted larvae were 185 (26.5%) first instars larvae, 280 (40%) second instars larvae, and 234 (33.5%) third instars larvae. Three species of *Przhevaeskiana* including *P.crossii* (47.8%), *P. aegagri* (35.5%) *and P. silenus* (16.6%) were recognized. High degree of infestation highlights the potential risk of economic burden caused by goat warble fly in west Azarbaijan and needs further research in order to decrease the rate of infestation in goats.

Keywords: *Przhevalskiana* spp, myiasis, goat, Warble fly

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Introduction

Goats are one of the most resourceful and efficient ruminants (Mussman, 1982). Easy handling, independence and adaptability to living free, modest feeding requirements, good tolerance to climate in semi−arid and arid regions, effective conversion of limited resources into meat, milk and hides are desired factors favoring the goat as a stock animal for small-scale farmers (Balicka-Ramisz, 1999; Harper and Penzhorn, 1999). Goats with emphasis on dairy production are very important in Iran. According to Iran Veterinary Organization report, there are approximately 580000 goats in West Azerbaijan province (north-west of Iran). Goats are usually reared together with sheep at the same farms.

In West Azerbaijan province, goat farming is a popular activity not only for meat, milk and cheese production but also because this species can utilize vast areas of marginal lands that are not suitable for other species. The warble fly is an economically important parasite since it reduces the quality of animals' hides and wool in Angora goats. Moreover, it reduces the body weight in the affected animals (Liakos, 1986). The costs of myiasis are considerable (Sol *et al*., 2001). Goat warble fly infestation as a subcutaneous myiasis presents in many European and Asian countries. Although the presence of this parasite dates back to the second half of the nineteenth century, goat warble fly etiology has remained uncertain till recent years and several studies reported the existence of more than one species. On the basis of the morphological differences, three different species have been suggested (Zumpt, 1965) including *P. silenus* Brauer, 1858, *P. crossii* Patton, 1922 and *P. aegagri* Brauer, 1863.

The frequency of *Przhevalskiana* spp. in goats has been reported in different regions of Iran, i.e., 4.2% in East Azarbaijan (Mosavi, 1998), 51% in Esfahan (Bagi Bageban., 1994), 15.2% in Yasooj (Bagi Bageban, 1994), 93% and 63.3% in Fars proviance (Rahbari *et al*., 1992, Jafari-Shoricheh and Rezazadeh-vishkaei, 1997) and 40% in Khouzestan proviance (Navidpoor and Golamian, 2005). However, direct and indirect economical damages due to this parasite in Iran have not been well indicated.

To date, the importance of infestation to *Przhevalskiana* spp. myiasis in goats in West Azerbaijan has not been investigated in detail. The aim of the current study was to assess the status of *Przhevalskiana* spp in native goats reared under traditional farming system in terms of different sex and age groups.

Materials and Methods

Study area and animals

Between September 2004 and June 2005, several visits were done to the Urmia abattoir to determine the origins, sex, and age of animals, the number of maggots present on each animal, location and larval stage. The goats were from traditionally managed farms. The animals had grazed in pasture throughout the year during the daytime and had been kept in sheds at nights.

The goats were divided into two groups according to their sex and age group, namely ≤2 and >2 years old. A minimum of 30 animals per month were examined throughout the study period. Inspections of slaughtered and skinned animals were carried out by examination of the inner skin surface and subcutaneous tissue.

Warbles were counted, measured and isolated by squeezing the subcutaneous nodules and preserved in 70% alcohol for later identification.

Experimental laboratory design

Larvae were measured, identified and classified according to the larval stage and species. Presence or absence and denticles density above the mouth-dots were the diagnostic characters for identification of

different species. In *P. aegagri,* area above the mouth-dots is without teeth. In *P. crossii* teeth are small, but still quite distinct, and arranged in a single, medially interrupted row although in *P. silenus* third larval teeth are few and extremely small, quite irregularly and highly reduced (Zumpt, 1965).

Statistical analysis

The data were analyzed by Chi square test. Significant differences were taken at $P \leq 0.05$ (SPSS 16 version) (Remingtone and Schork, 1970).

Results

Out of 867 examined animals, 113 (13%) were parasitized, in which 91 (80.5%) were females and 22 (19.5%) were males. Among examined animals, 277 were ≤2 years old and 590 were >2 years old animals in which 32 (28%) and 81 (72%) were infested to *Przhevalskiana* spp., respectively (Table. 1). In October 2004, larvae were found under the subcutaneous tissue of slaughtered animals at the first stage of development. During the study 699 larvae were found in the subcutaneous tissue of slaughtered animals. The minimum, maximum and mean values for the number of larvae per animal were 1, 18 and 6.18, respectively. There were 185 first instars larvae (26.5%), 280 second instars larvae (40%), and 234 third instars larvae (33.5%) recovered according to the developmental stages. No larvae were found between May and June 2005. The larvae only presented in subcutaneous tissue and there was no significant difference between the infestation of males and females and among two age groups ($p<0.05$). According to the number of mouth hooks of pseudocephalon on third stage larvae, three species of *Przhevaeskiana* including ***P.crossii*, (47.9%) *P. aegagri*** (35.5%) *and P. silenus* (16.6%) were identified.

Discussion

Several surveys have been carried out to determine the prevalence of *Przhevaeskiana* spp. around the world. In Anatolia (Turkey), the infestation rate ranges from 53 to 94% of flocks (Sayin *et al*., 1973 a and b). The infestation rate was 24% in Albania (Tagari and Manehasa., 1973) and 22 to 25% in Iraq (Abul-Hab and Al-S'adi., 1974). In Italy and Greece, the infestation rate exceeds to 70% (Himonas, 1982; Puccini and Giangaspero., 1983). In Iran, the infestation rate varies from 4.2 to 93%, depending on the area. The prevalence of *Przhevalskiana spp*, in goat in this study (13%) is lower than the aforementioned reports and southern part of Iran as well (Fars and Khouzestan provinces), (Bagi Bageban, 1992; Rahbari *et al*., 1992; Navidpoor and Golamian., 2005). However, it is similar to other studies reporting the infestation rate in Yasooj (15.2%), (Bagi Bageban, 1994), and Egypt (Morsy *et al*. 1998) where a 11.68% infestation has been reported among slaughtered goats. The maximum and minimum numbers of parasite (1-18 larvae) for each infested animal was lower than similar reports in southern part of Iran (2-200 parasites per infected animals) and in agreement with reports from Italy (Wall and Shearer, 2001) and Saudi Arabia (El-Azazy., 1996). The low prevalence and intensity of parasite in this area in comparison with results from southern part of Iran could be attributed to the climate conditions in west Azerbaijan. The climate of this region is cold and semiarid, with mean annual rainfall of 257.2 mm. The maximum monthly mean temperature of 28.3° C in August and the minimum monthly mean temperature of -5 ° C in January have been recorded. Thus, it seems that adult flies are more active during summer and spring time in this region.

It has been shown that, younger animals appear to be more prone to infestation than older animals (Wall and Shearer, 2001) although, in the present study there was no difference in prevalence of myiasis between two age groups.

In the present study, there was not any significant difference between infestations in

Table 1. Number and percentage of infested animals, divided according to the time of sampling, sex and age groups.

		Infected animals					
Month	**Examined animals**	**Females**	**males**	**Age group1**	**Age group**	**Overall**	**number %**
September	30	--	--	---	---	----	---
October	60	2	--	---	2	2	(3.3%)
November	95	7	2	5	4	9	(9.5%)
December	143	20	6	8	18	26	(18.2%)
January	166	24	8	9	23	32	(19.3%)
February	85	16	3	3	16	19	(22.3%)
March	99	20	3	9	14	23	(23.2%)
April	76	2	--	--	2	2	(2.6%)
May	64	---	---	--	--	--	---
June	49	--	---	---	-	--	--
Total	867	682	185	277	590	113	(13%)

male and female confirming the result by Jafari-Shorigeh and Rezazadeh_ Vishkaeii in 1997.

Since the larvae were found from October to April, we concluded that an effective drug against *Przhevaeskiana* spp. at least 1-2 times at the season of adult flies activity (spring and summer) could decrease the incidence of the infestation in this area.

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بررسی فراوانی آلودگی به گونه های پرژوالسکیانا در بز در استان آذربایجان غربی، ایران

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چکیده

مگس واربل بز عامل میاز جلدی است که در برخی کشورهای آسیایی و اروپایی وجود دارد. این انگل خسارات اقتصادی فراوانی ایجاد می نماید. این بررسی از شهریور ۱۳۸۳ تا تیر ماه ۱۳۸۴ به منظور تشخیص آلودگی به مگس واربل در بزان کشتار شده در کشتارگاه ارومیه انجام شد. در این مطالعه تعداد حیوانات آلوده، سن و جنس، تعداد نوزاد مگس در هر دام آلوده، محل آلوده و مرحله نوزادی ثبت گردید. بافت زیر جلد و لایه داخلی پوست حیوانات پس از پوست کنی از نظر آلودگی به واربل ها آزمایش گردید. در این مطالعه از تعداد هفتصد و شصت و هفت بز بالغ شامل ۱۸۵ بز نر و ۶۸۲ بز ماده نمونه گیری شد. نتایج حاکی از آلودگی ۱۱۳ راس(۱۳٪) شامل ۹۱ بز ماده(۸۰/۵٪) و ۲۲ (۱۹.۵٪) بز نر بود. هم چنین از۲۷۷ و ۵۹۰ بز دو و زیر دوسال و بالای دو سال آلودگی به گونه های *پرژی والسکیانا* به ترتیب در ۳۲(۲۸٪) و ۸۱(۷۲٪)راس بز دیده شد. نتایج حاکی از عدم اختلاف معنی دار بین آلودگی در جنس و سنین مختلف بزها داشت ($p<0.05$) . در این مطالعه مجموعاً ۶۹۹ لارو انگل از بافت های زیر جلدی حیوانات کشتار شده جدا گردید. حداقل و حداکثر لارو مگس جدا شده از هر حیوان و میانگین تعداد آنها به ترتیب ۱۸و۱ و ۶/۱۸ بود.در این بررسی تعداد لارو مرحله اول، دوم و سوم به ترتیب ۱۸۵(۲۶/۵٪)، ۲۸۰(۴۰٪) و ۲۳۴(۳۳/۵٪) بود. سه گونه *پرژی والسکیانا* شامل *پرژی والسکیانا کروزی* (۴۷/۸٪)، *پرژی والسکیانا آگاگری* (۳۵/۵٪) و *پرژی والسکیانا سایلنوس* (۱۶/۶٪) با توجه به خصوصیات مرفولوژیکی شناسایی گردید. با توجه به اهمیت پرورش بز در این منطقه و آلودگی به میاز جلدی در بزان توجه بیشتری باید به منظور کاهش آلودگی صورت پذیرد.

واژگان کلیدی: گونه های پرژی والسکیانا، بز، مگس واربل، میازیس